

Quiz 1 - Solutions

[1] 1. Determine angle F if $\sin \angle F = \frac{2}{3}$.

Ans: $\angle F = \sin^{-1}\left(\frac{2}{3}\right)$
 $\doteq 41.8^\circ$

[2] 2. A roof is in the shape of an isosceles triangle with equal angles of 25° and an altitude of 4 m. How long are the sloping rafters JH and JL?

Ans. $JH = JL$

~~$\sin 25^\circ = \frac{4}{JH}$~~

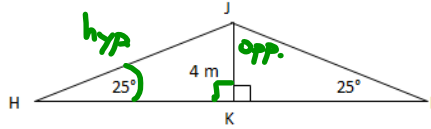
$JH \times \sin 25^\circ = 4$

~~$\frac{JH \times \sin 25^\circ}{\sin 25^\circ} = \frac{4}{\sin 25^\circ}$~~

$JH = \frac{4}{\sin 25^\circ}$

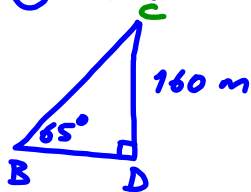
$JH \doteq 9.5$

\therefore The sloping rafters are approx. 9.5 m long.



[5] 3. The Skylon Tower in Niagara Falls is about 160 m high. From a certain distance, Philip measures the angle of elevation to the top of the tower to be 65° . Then he walks another 20 m away from the tower in the same direction and measures the angle of elevation again. Use primary trigonometric ratios to determine the measure of the new angle of elevation. Hint: Draw a diagram.

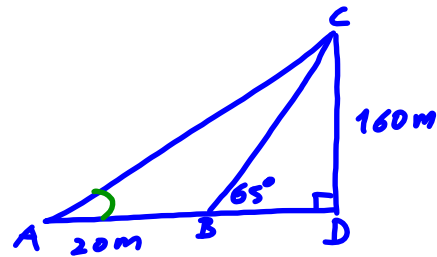
① Find BD



$\tan 65^\circ = \frac{160}{BD}$

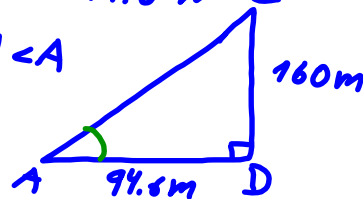
$BD = \frac{160}{\tan 65^\circ}$

\therefore $BD = 74.6 \text{ m}$



② $AD = AB + BD$
 $= 20 + 74.6$
 $= 94.6 \text{ m}$

③ Find $\angle A$



$\tan A = \frac{160}{94.6}$

$\angle A = \tan^{-1}\left(\frac{160}{94.6}\right)$

\therefore $\angle A = 59.4^\circ$